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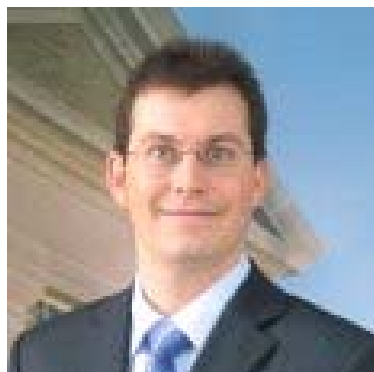
IBM z World 2009



Session: C-5

CICS既存アプリケーションがSOA環境で蘇る！
CICS 最新版におけるSOAサポートの実力

SOA support in CICS TS V3 and V4



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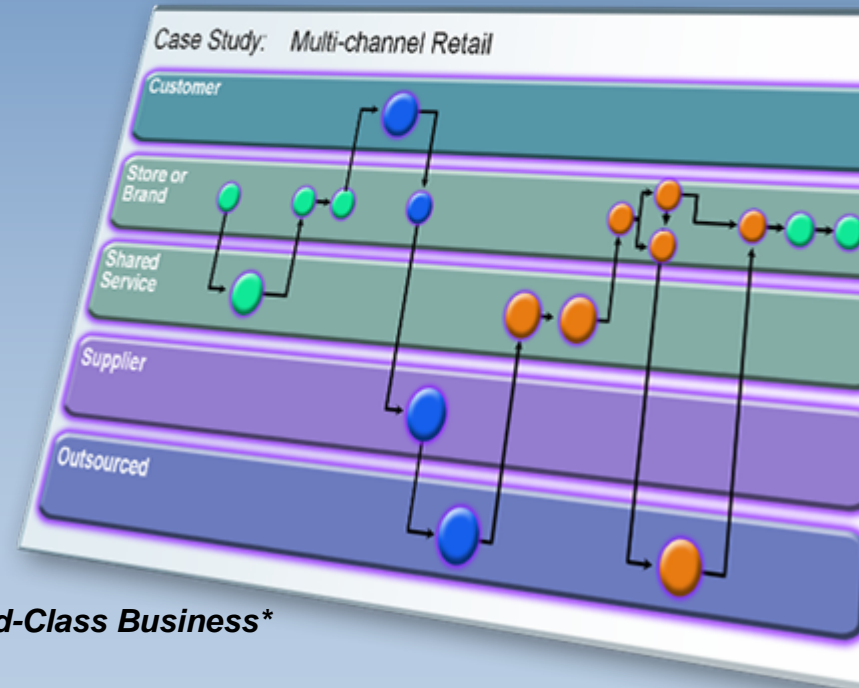
dave_andrews@uk.ibm.com

Why SOA for business flexibility and reuse?

Flexible business requires flexible IT

- **Economics:** globalization demands flexibility
- **Business processes:** changing quickly
- **Growth:** at the top of the CEO agenda
- **Reusable assets:** can cut costs
- **Information:** greater availability
- **Crucial for flexibility and becoming an On Demand Business**

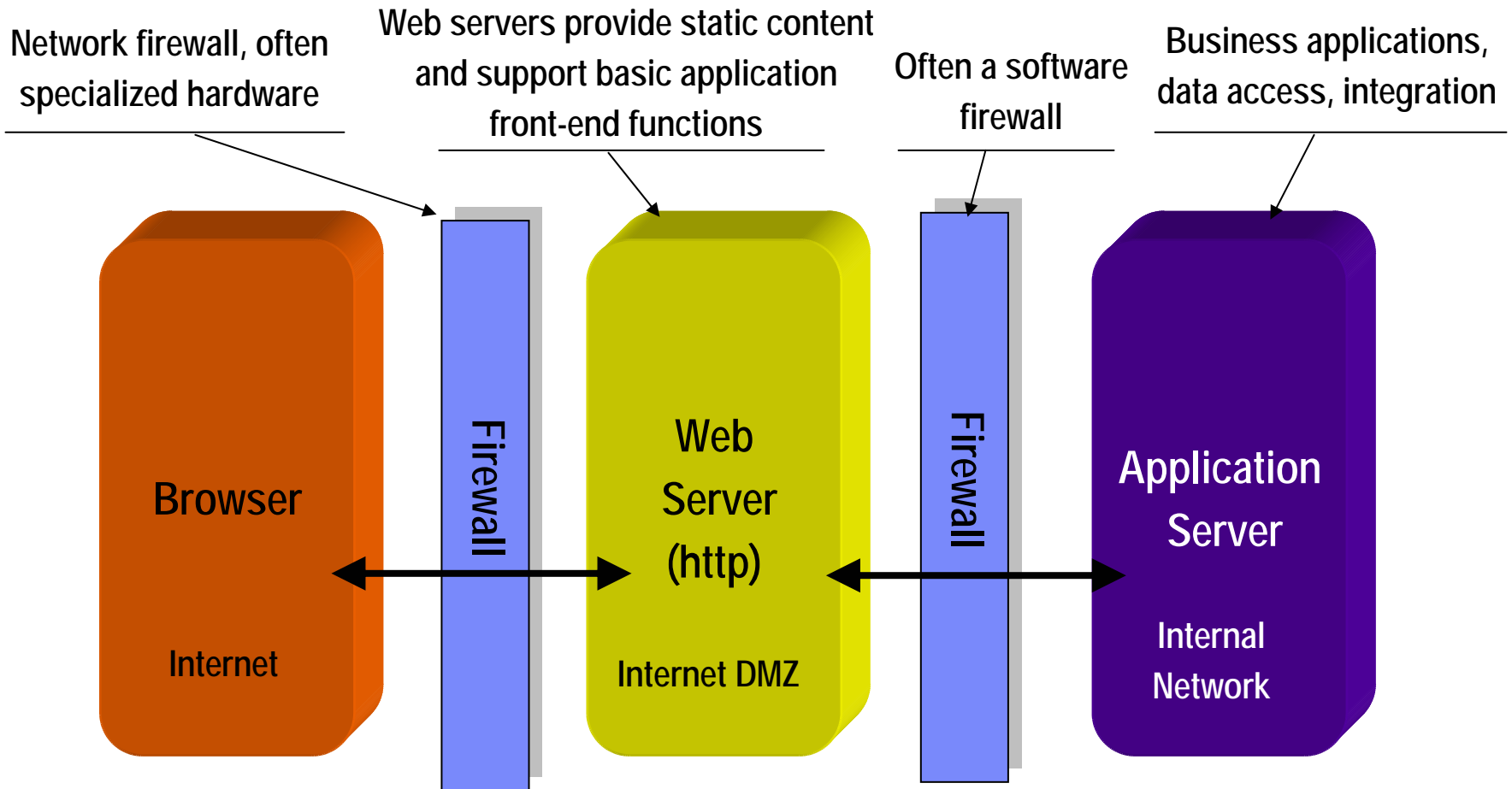
Traditional Business*



Today's World-Class Business*

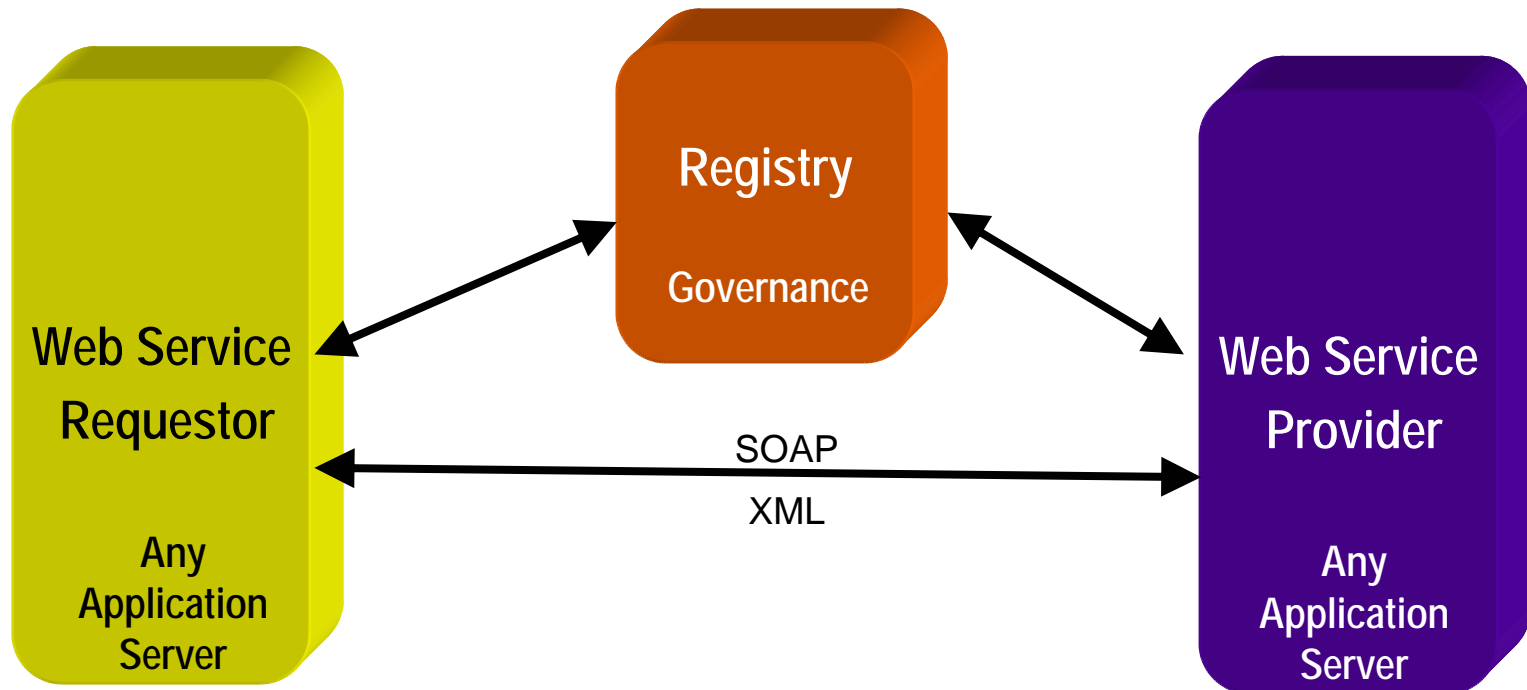
*Sources: CBDi

Typical Web Application Server Deployment Topology



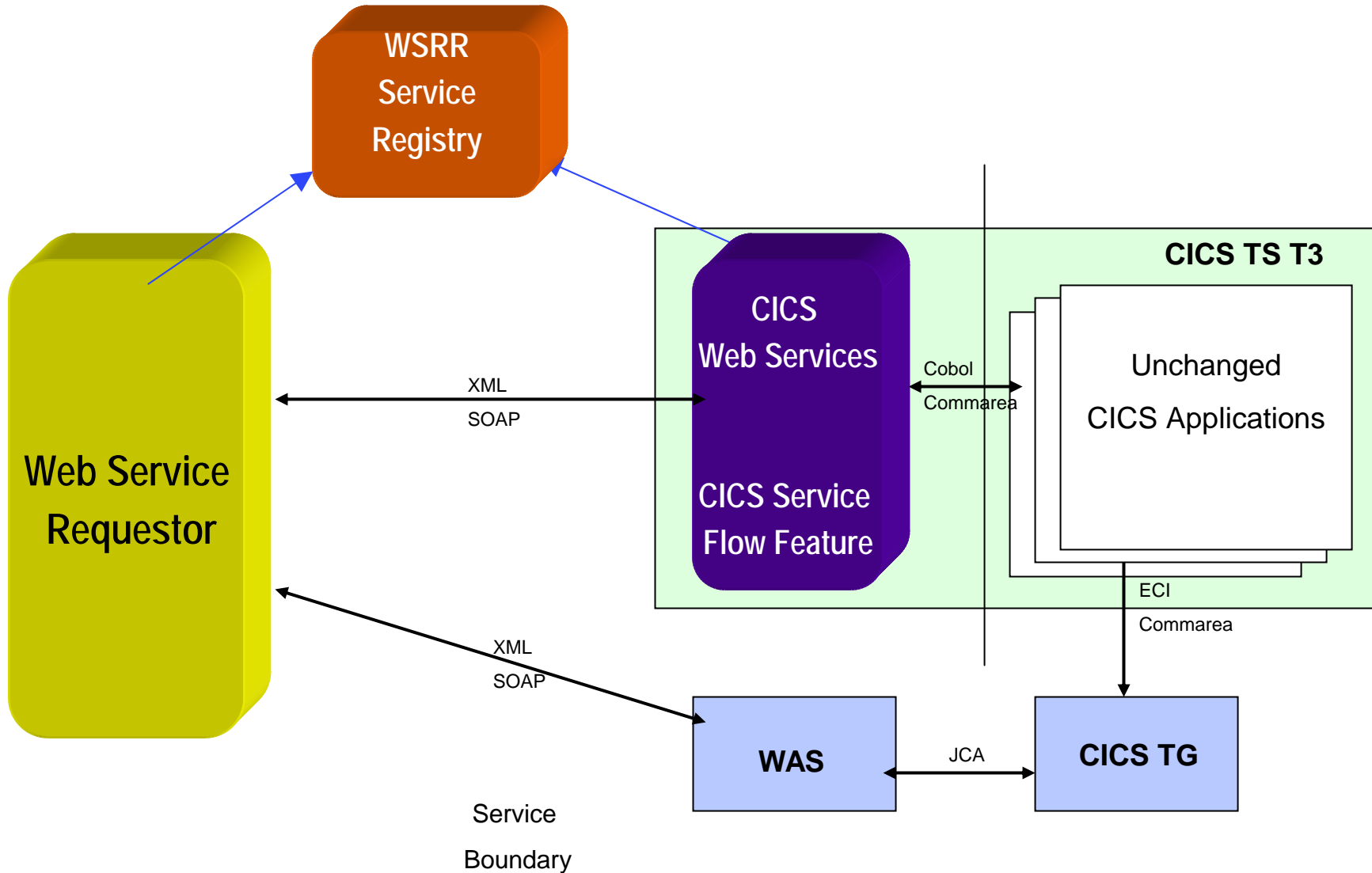
Modernization through Richer User Interface
Global Access and Self Service Applications

Typical Web Services Application Server Topology



- SOA:** Create Reusable Services that plug together using Standards
- Reuse:** Encapsulate existing Business Logic (Service Enablement)
- Control:** Governance provided by a Services Registry and Repository

CICS WebServices Support



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SOA support in CICS TS V3 and V4

IBM United Kingdom
CICSTS開発担当およびチーム・リーダー
Dr. Darren Beard (ダレン ビヤード)

Agenda

- Web Services in CICS TS V3
- CICS SOA Roadmap
- CICS TS V4.1 SOA Highlights
- Questions (質問)

Web Services at a glance in Version 3

CICS TS V3.1

The runtime support in CTS 3.1 is for

- WSDL 1.1
- SOAP 1.1 and SOAP 1.2
- WS-I Basic Profile 1.1
- XML 1.0
- WS-I Simple SOAP Binding Profile 1.0
- WS-AT 1.0
- WS-Security 1.0

■ Provides batch tooling to handle generation of data mappings

- Schema into (and vice-versa)
 - C and C++
 - PI/I
 - Cobol

CICS TS V3.2

Support was added for

- WSDL 2.0
- MTOM/XOP
- WS-Trust
- Additional schema data mappings

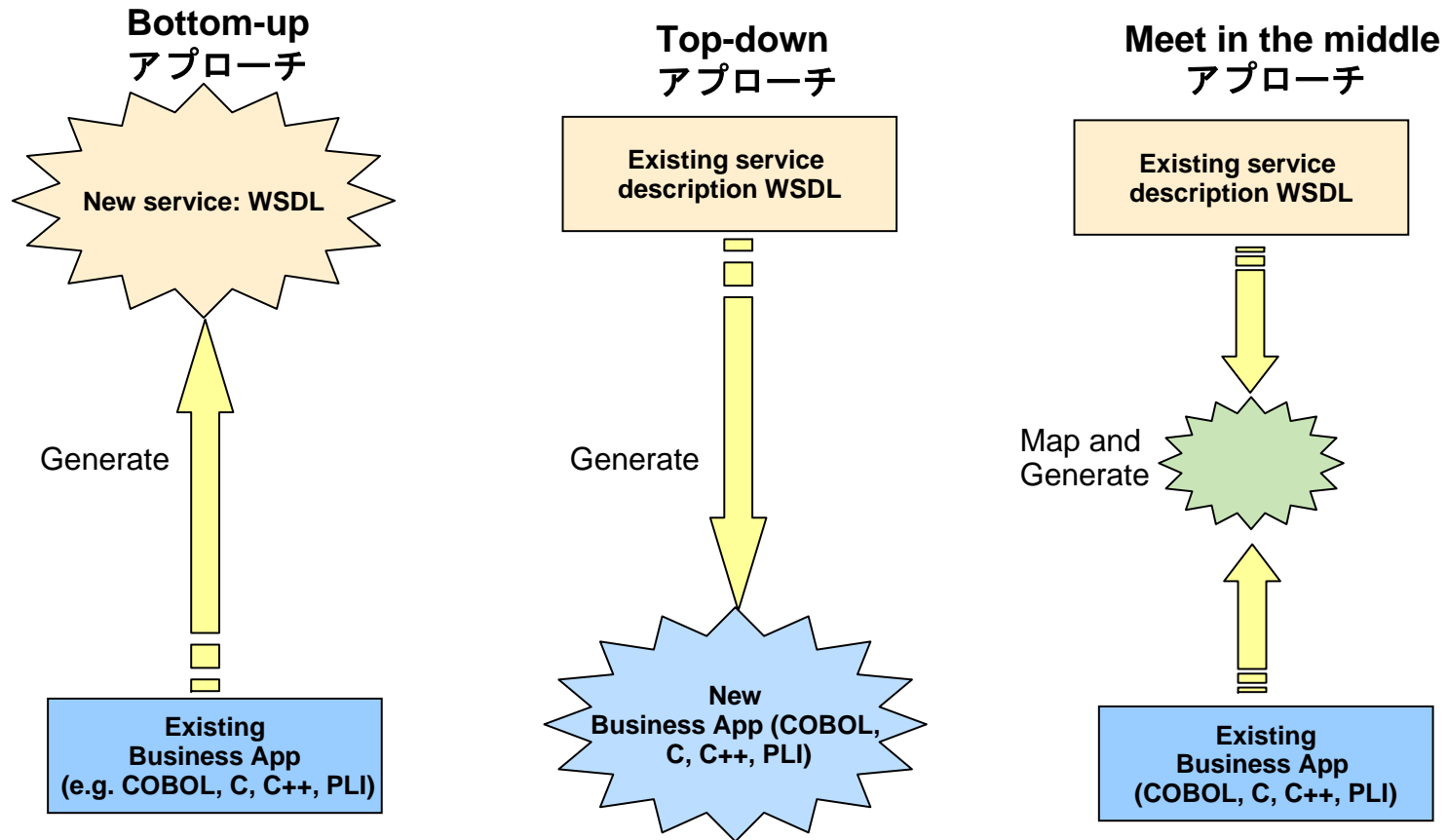
使用法のシナリオ

- CICS as a Service Provider using existing program (bottom up)
 - Existing application not changed
 - Existing language structure used

- CICS as a Service Provider using new program (top down)
 - New application
 - Existing WSDL

- CICS as a Service Requester using a new program (top down)
 - New application
 - Existing WSDL

Web Services Enablement Styles



CICS SOA Roadmap

CICS TS 3.2 (post GA support)

xsd:Any Support
inlining optional elements in schema
WS-AT enhancements
GLUEs for monitoring/management
MTOM/XOP over WMQ
PHP SupportPac

Additional Web services specifications supported

More XML System Services Usage

CICS TS 4.1

WS-Addressing
XML System Services Usage (Offload)
WSRR
XML Transform
SCA 1.0
ATOM Support

More Schema Data mapping

CICS TS 3.2 (GA)

SOAP 1.1 /1.2
WSDL 1.0/2.0

WS-Security 1.0
WS-AT 1.0
WS-Trust
MTOM/XOP

Web Services Vision

CICS TS continues as a First-Class Web Services endpoint (Provider and Requester).

The environment of choice for Web Services that interact with CICS assets.

CICS TS V4.1 SOA Highlights

- Web Services の強化
 - Web サービス・アドレッシング
 - Use of system services XML parser
 - Data Mapping improvements
 - WSRR support
- Resource Deployment / Life cycle – バンドル
- WEB 2.0 / ATOM Support
- CICS PIPELINE Internal Transport
- サービス・コンポーネント・アーキテクチャー のサポート

Web Services の強化

- Delivering CICS Web サービス・アドレッシングのサポート
 - Improve flexibility in SOAP message routing
- Reducing the cost of web services by offloading XML parsing
- Providing generalized XML to language structure system mapping component and data mapping enhancements
- Integrating WSRR support with CICS Web Services assistants

WS-Addressing
Web サービス・アドレッシング

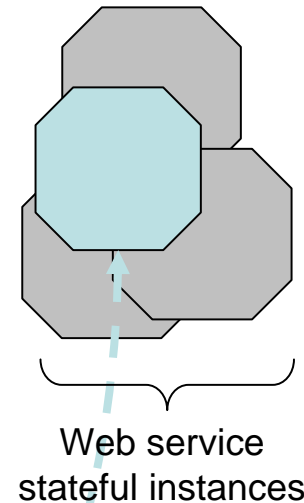
Web サービス・アドレッシング - goals

- Defines transport-neutral mechanisms to address Web services
 - Improves interoperability with other Web Services implementations such as .NET
 - XML elements to identify Endpoints: **EndpointReferences (EPRs)**
 - エンドポイント参照
 - WS-Addressing Message Addressing Properties (**MAPs**)
 - メッセージ・アドレッシング・プロパティ

Web サービス・アドレッシング - エンドポイント参照 (EPR)

Standard (XML) mechanism for referencing an Web service instance.

This reference can be passed to clients of the Web service.
The EPR is opaque to the client.



```
<wsa:EndpointReference>
  <wsa:Address>
    http://example.com/shopping
  </wsa:Address>
  <wsa:ReferenceParameters>
    <tns:ShoppingReference>
      uuid:84decd55-7d3f-65ad-ac44-675d9fce5d22
    </tns:ShoppingReference>
  </wsa:ReferenceParameters>
</wsa:EndpointReference/>
```

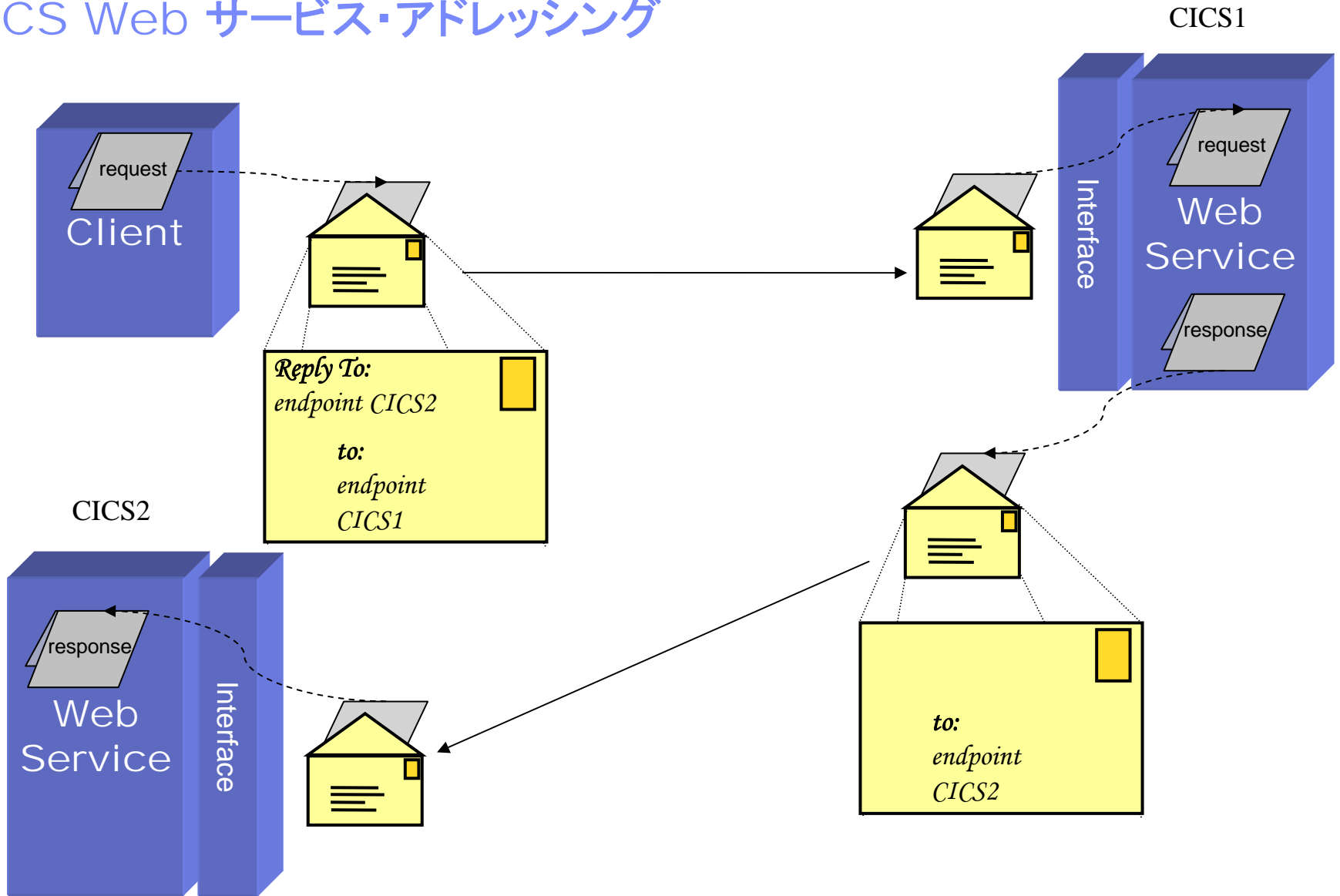
Identifier in message differentiates the resource/instance (fronted by the Web service) that this EPR represents

Web サービス・アドレッシング – (メッセージ・アドレッシング・プロパティー)

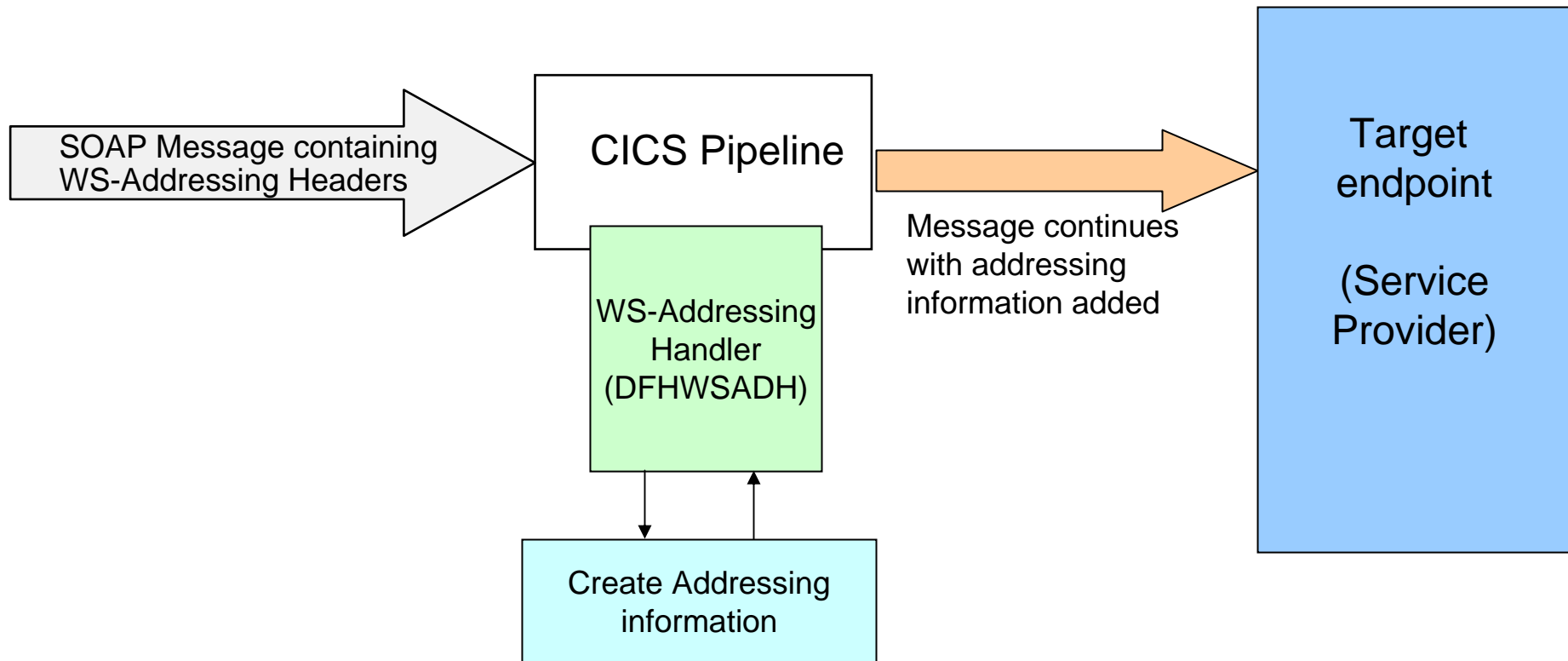
- Standard placeholders in the SOAP header for WS-Addressing information

Name	Type	Description
To	URI	Defines the address of the intended receiver of this message.
Action	URI	An identifier that identifies the semantics implied by this message
MessageID	URI	Unique MessageID of the message
RelatesTo	URI	The MessageID of a message to which this message relates
From	EPR	The endpoint of the originator of this message
ReplyTo	EPR	The endpoint to which replies to this message should be directed
FaultTo	EPR	The endpoint to which faults of this message should be directed

CICS Web サービス・アドレッシング



Web サービス・アドレッシング in CICS (Requester)



Web サービス・アドレッシング in CICS (Requester)

- Pipeline configuration
 - Configure Requester pipeline to use WS-Addressing handler giving specification version
 - CICS supports submission and final specifications, so need to specify which one to use
 - If the requester application is not aware requests are WS-Addressed
 - CICS handles the required addressing responses
 - If the requester application is WS-Addressing aware
 - Use EXEC CICS API to set Message Addressing Properties (MAPs)

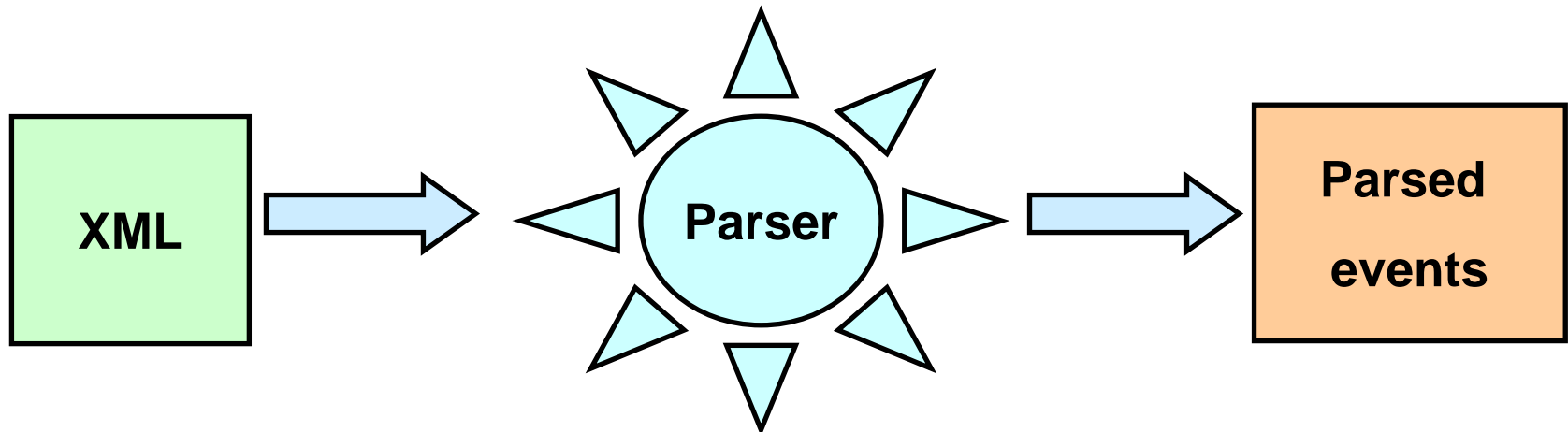
Web サービス・アドレッシング in CICS (Provider)

- Pipeline configuration
 - Configure Provider pipeline to use WS-Addressing handler
- If the provider application is not aware request/response is WS-Addressed
 - CICS handles the required addressing responses and routing
- If the provider application is WS-Addressing aware
 - use EXEC CICS API to interrogate Addressing Context (e.g. Fetch EndPointReference (EPR) to extract Reference parameters)

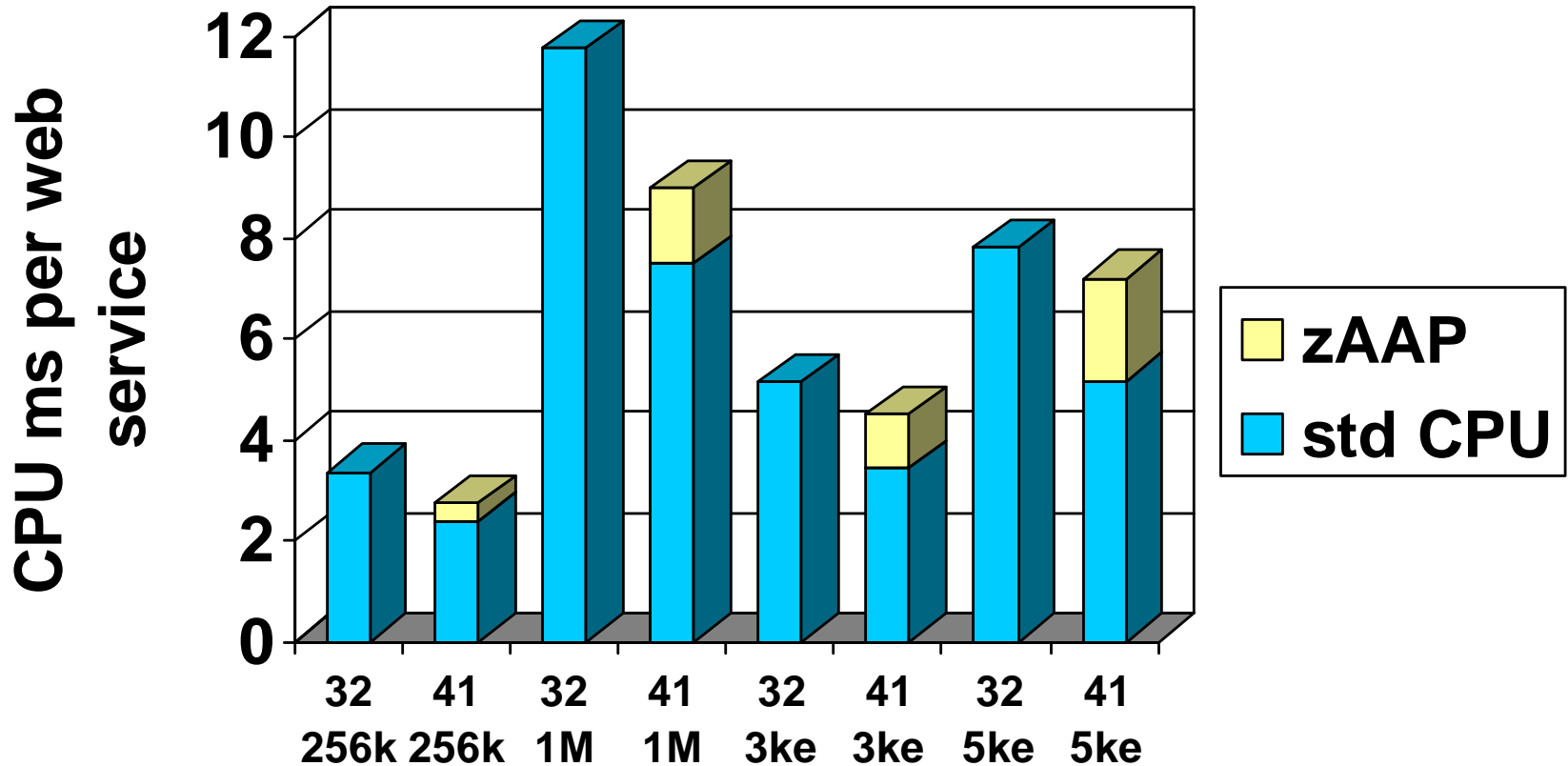
XML パーサーの強化

System Services Parser Exploitation

- CICS SOAP node now uses the z/OS System Services XML Parser
 - the parser is a callable service provided by z/OS
 - zAAP capable, so reduces cost of parsing and so the cost of web services processing overall
 - performance improvement over previous parser
 - parser uses 64 bit storage



性能



32 – CICS TS 3.2

41 – CICS TS 4.1

Web services Mapping
and general data mapping services

CICS Mapping Improvements: Level 3.0

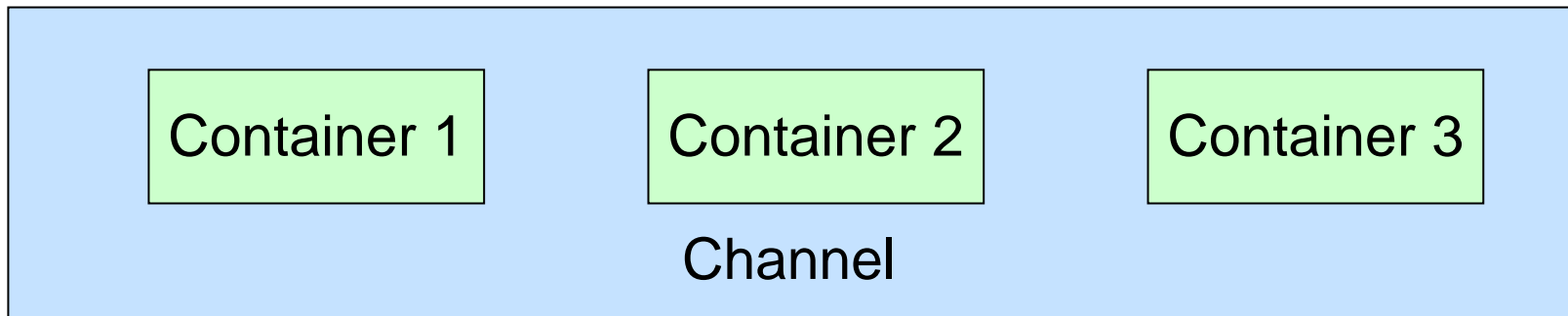
- Support for xsd:dateTime fields
 - DFHWS2LS and DFHSC2LS
 - New input parameter
 - DATETIME={PACKED15|STRING}
 - > PACKED15: xsd:dateTime fields are mapped to CICS ABSTIME format
 - > STRING: xsd:dateTime fields are mapped to text
 - DFHLS2WS and DFHLS2SC
 - New input parameter
 - DATETIME={UNUSED|PACKED15}
 - > UNUSED: Any dateTime fields are not mapped as timestamps
 - > PACKED15: Any dateTime fields are mapped as timestamps
 - xsd:dateTIME values are treated as RFC 3339

XML to language structure mapping services

- New API to convert between XML and application data
 - Map between XML and language structure
- TRANSFORM
 - TRANSFORMTYPE(XMLTODATA ; DATATOXML)
- Command options depend on the direction of the transformation
 - XMLTODATA will require XMLTRANSFORM resource
 - XMLTRANSFORM
 - resource must be installed via Bundle support
 - uses metadata generated by Assistants for the transformation

Bottom up deployment (using containers)

- In CICS TS 3.1, all bottom-up deployment was from COMMAREA driven programs
- We (IBM) recommended using many containers when restructuring data
- Problem, how to web service enable (bottom-up) a container driven application which uses many containers?



Using Channels in a CICS Web Service Provider

- DFHLS2WS
 - New input parameters
 - REQUEST-CHANNEL
 - Name of the channel descriptor file describing the input request
 - RESPONSE-CHANNEL (optional)
 - Name of the channel descriptor file describing the output response
 - Channel descriptor file
 - XML document
 - Describes the attributes of the containers in the channel
 - Required and optional
 - CHAR or BIT
 - Defines the location of the language structure for the containers

WebSphere Service Registry and Repository (WSRR)

WebSphere Service Registry and Repository のサポート

- A Web service registry is the 3rd aspect of Web services
 - Requester, provider, registry
 - WSRR provides a central repository for Web services and offers capabilities to
 - search
 - version
 - enforce governance
 - much more
 - Assists best practises
 - encourages discovery and reuse of web services

WebSphere Service Registry and Repository のサポート

- CICS and WSRR
 - Publish WSDL representing CICS Web service providers
 - Retrieve WSDL representing Web services to be used by CICS requesters
 - Complements CICS Web services assistants, WSDL editors, etc.
 - Available as SupportPac CA1N for CICS TS V3

CICS TS 4.1 の WSRR サポート

- CICS TS 4.1 delivers WSRR support as part of the base product
 - enhances functionality
 - enhances documentation
 - enhances support

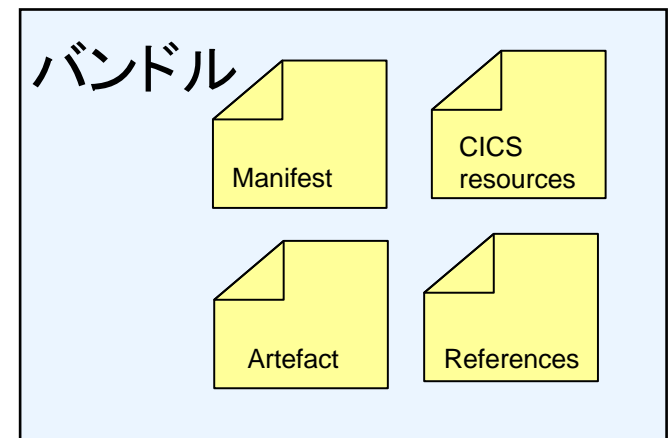
- Integrate SupportPac batch capabilities into the CICS Web services assistants
 - DFHLS2WS extension
 - Generate a WSDL file and WSBind file from copybooks and publish WSDL file to WSRR
 - DFHWS2LS extension
 - Extract a WSDL file from WSRR and generate copybooks and WSBind file

Bundle Resources

アプリケーション バンドル

バンドルとは?

- BUNDLE Resource, a new resource in CICS TS 4.1
 - like a CEDA group except that contents are remembered after installation
- Manifest File describes contents
- Defines
 - Event Binding
 - XSD Bindfile
 - SCA Composite which can create
 - URIMAP
 - WEB SERVICE
 - User extensible via Callback program



バンドルの内容

```
.../bundle5
  /META-INF
    cics.xml
  /scaproject
    testcomposite.scdl
```

```
<?xml version="1.0"?>
<tns:manifest xmlns:tns="http://www.ibm.com/xmlns/prod/cics/bundle"
  bundleVersion="1" bundleRelease="0">

  <tns:define      name="MyComposite"
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/SCACOMPOSITE"
                  path="scaproject/testcomposite.scdl" />

  <tns:import      name="PAYROLL"
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/PROGRAM" />

  <tns:import      name="TaxQuery" |
                  type="http://www.ibm.com/xmlns/prod/cics/bundle/WEBSERVICE" />

</tns:manifest>
```

バンドル CEMT view

INQ BUNDLE

STATUS: RESULTS - OVERTYPE TO MODIFY

Bun (TEST3) Dis Par (00002) Tar (00002) Enabledc (00000)

Bun (/u/fbohm/bundles/bundle3/)

Bun (TEST5) Ena Par (00001) Tar (00000) Enabledc (00000)

Bun (/u/fbohm/bundles/bundle5/)

RESPONSE: NORMAL

SYSID=FRA1 APPLID=IYK3ZBB1

TIME: 12.18.24 DATE: 01/28/09

PF 1 HELP

3 END

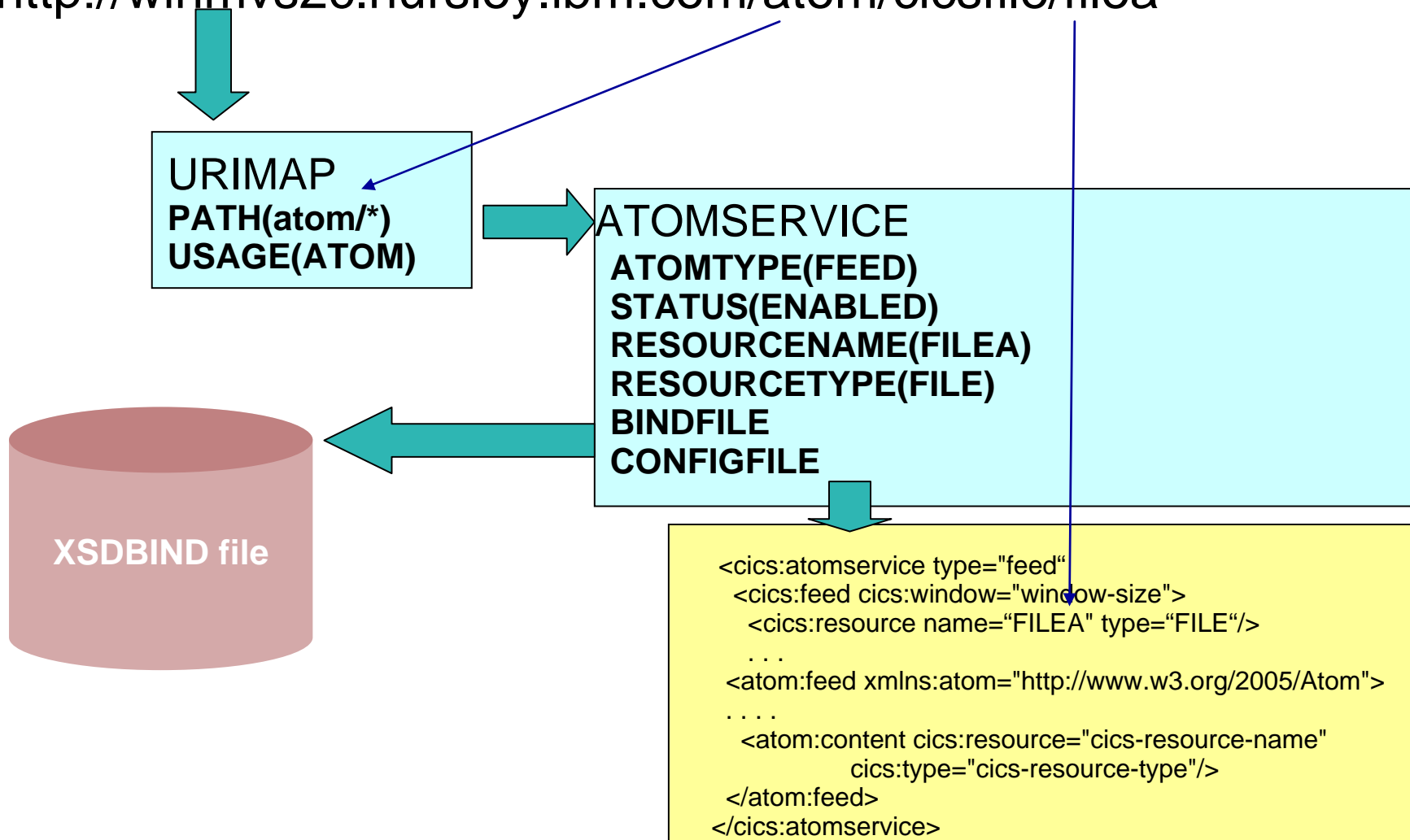
5 VAR

7 SBH 8 SFH 9 MSG 10 SB 11 SF

CICS WEB 2.0 / ATOM Support

CICS TS 4.1 ATOM のサポート

<http://winmvs2c.hursley.ibm.com/atom/cicsfile/filea>

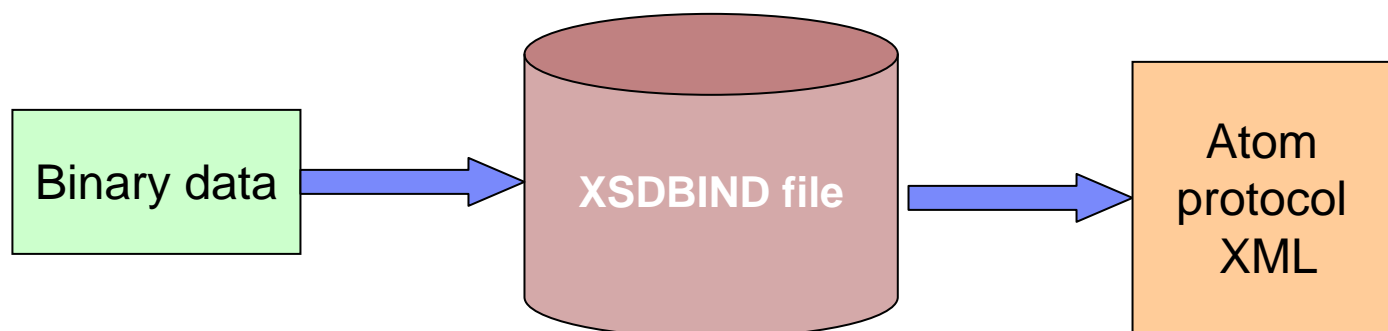


AtomService CONFIGFILE

- Specify the CICS resource attributes of the feed
- `<cics:atomservice type="typevalue">`
 - Root element for an Atom configuration file and the type of Atom document
- For feed documents: `<cics:feed cics:window="window-size">`
 - Specify the number of entries that CICS is to return in each feed document
- `<cics:resource> name="cics-resource-name" type="cics-resource-type">`
 - Specify name and type of CICS resource to be published
 - Or provide a program to create data from any source
- `<cics:fieldnames>`
 - Identify the CICS resource field names that provide items of metadata

AtomService BINDFILE

- CICS Utility DFHLS2SC
 - Generates an XML schema and an XSD binding file from a language structure
 - XSD bind file describes the record layout of the CICS resource used as a feed
 - Maps the contents of the TS queue or File record etc. onto the Atom protocol XML



Systems Programmer Interface for Atom Feeds

- CREATE ATOMSERVICE
- DISCARD ATOMSERVICE
- INQUIRE ATOMSERVICE
- SET ATOMSERVICE
- INQUIRE URIMAP

CICS Internal Transport

CICS PIPELINE Internal Transport

- PIPELINE Currently has two transport types based on URI
 - HTTP / HTTPS use HTTP Transport
 - WMQ / JMS use the WMQ Transport
- Adding a CICS Transport that uses internal services rather than the network for CICS <-> CICS service calls
 - New CICS URI Format
- A more flexible version of the local optimization that already exists for Web Services

CICS Transport URI format

- Have the request target a program
 - `cics://program/MYPROG`
- Have the request target a Service (Provider pipeline)
 - `cics://service/myService?targetService=/myProviderApp/ServiceUri`
- Have the request run a second Requester Pipeline
 - `cics://pipeline/MYPIPE`

Service Component Architecture

サービス・コンポーネント・アーキテクチャー

サービス・コンポーネント・アーキテクチャー とは?

- A set of specifications which define how to
 - write small components (something which implements a small piece of function)
 - make components easily re-usable
 - make components easy to call from different environments
 - as a web service
 - as a linked program
 - etc
 - separates application code from deployment and configuration information
 - construct applications from the components

CICS サービス・コンポーネント・アーキテクチャーのサポート

- CICS SCA Infrastructure
 - Types of services
 - **Channel based services**
 - Allow CICS LINKable assets to be defined as a component interface
 - Available to other CICS programs that use the INVOKE SERVICE command
 - **XML based services**
 - Available to CICS applications that use the INVOKE SERVICE command
 - Available to business services on an external network
 - New EXEC CICS INVOKE SERVICE command
 - INVOKE WEBSERVICE command now a synonym of INVOKE SERVICE. The two commands are identical.

サービス・コンポーネント・アーキテクチャー tooling

- Use SCDL to describe a composite
 - RDz SCA tooling
 - Wizards for CICS Component and Composite creation
 - Composite editor
 - Wizard for Bundle creation/deployment

Rational software

Rational Developer
for System z

Design → Implement → Compose → Run → Test



Summary

概要

概要

- Web Services の強化
 - Web サービス・アドレッシング
 - Use of system services XML parser
 - Data Mapping improvements
 - WSRR support
- Resource Deployment / Life cycle – バンドル
- WEB 2.0 / ATOM Support
- CICS PIPELINE Internal Transport
- サービス・コンポーネント・アーキテクチャー のサポート

References

- CICS TS 4.1 Infocenter
 - <https://publib.boulder.ibm.com/infocenter/cicsts/v4r1/index.jsp>

- CICS homepage
 - <http://www-01.ibm.com/software/htp/cics/>

- Red book “Architecting Access to CICS within an SOA”
 - <http://www.redbooks.ibm.com/abstracts/sg245466.html?Open>

ご質問はございますか

どうも有難うございました

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